



# Crystals and Mud in Nature

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# Crystals and Mud in Nature

**Richard J. Lazarus\***

## INTRODUCTION

Professor James Salzman has written a wonderful article, which promises an equally wonderful book.<sup>1</sup> His article intelligently and thoughtfully examines the forces that compete, conflict, and combine in the creation of laws relating to drinking water. These include, of course, the physical characteristics of the resource itself and how the resource relates to essential biological needs of humankind. But as Professor Salzman demonstrates, the biological role is only one of several perspectives on drinking water relevant to the kind of legal rules that apply to it. The article describes drinking water as a cultural resource, a social resource, and an economic resource, contending that one has to consider each of these various “natures” of a natural resource to determine how best to fashion legal rules governing its management.<sup>2</sup> The article readily reminds us how much human history and culture relates to natural resources law.

For the purposes of this commentary, however, I would like to expand on two reactions I had to the article. The first is that the article’s narrow focus on one use of water undermines some of the article’s conclusions by understating water’s complexity. And the second is why the article made me think about dirt, and ultimately about mud, and the juxtaposition of water and dirt in natural resources law.

## I. WATER’S COMPLEXITY

My first reaction is that the article ignores water’s true complexity. In particular, the article conflates one specific use of a resource, albeit an important one, with the resource itself, as underscored by the article’s

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\* Professor of Law, Georgetown University Law Center. I would like to thank Jeannette Austin for reviewing a preliminary draft of this essay and providing much needed editorial suggestions.

1. See James Salzman, *Thirst: A Short History of Drinking Water*, 18 YALE J.L. & HUMAN. 94 (2006).

2. *Id.* at 96-97.

conclusion that “[d]rinking water is a dauntingly complex resource to manage.”<sup>3</sup> The central difficulty is that *water* and not *drinking water* is the resource and neither water uses nor related water management approaches are susceptible to the kind of usufructary-specific severance that the article employs.

Uses of water are obviously extraordinarily varied. Not only is water an essential ingredient of human life—indeed the vast majority of the chemical makeup of the human body itself; water is also necessary for every other kind of animal and plant life on the planet, necessary for every manufacturing or industrial process, a major basis of transportation, a provider of security because of the barrier it creates, a source of energy within its flow, an indispensable basis of recreation, and an enormous source of aesthetic beauty.

Water can also be a source of human misery, and not just because there can be too little. As too well testified to by recent events in the Gulf Coast, the sheer force supplied by too much water can have devastating consequences.<sup>4</sup> Water in some contexts can provide security, but in others, flowing waters have the capacity to break down purported barriers of security, destroying homes, lives, and even entire ecosystems to the extent that flowing waters pick up, carry, and deposit toxic chemicals within their reach. To sever just one affirmative use, even one as important as drinking water, from all the other uses of water, both beneficial and harmful, is fraught with analytic difficulty for making generalizations about water law, let alone about social norms and societal views on the role of government and the market.

The focus on drinking water cannot even be supported on the ground that drinking water addresses a basic biological need. People do not consume water just by drinking water directly in a pure or largely unadulterated state. The basic human biological need for water is met in many different ways, including the production of foods that contain water. For most people, much of the water they need to survive is not consumed by drinking it directly.

Thus, there is a discomfoting artificiality to the article’s suggestion that drinking water laws present an issue distinct from laws dealing with the allocation of water to other uses such as agriculture.<sup>5</sup> Those agricultural uses, and many manufacturing processes that create consumable products, play no less a role in addressing the basic human need for water in order to maintain the basic biological systems upon which life depends. A narrow focus on drinking water oversimplifies and potentially misleads the

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3. *Id.* at 96.

4. Joseph B. Treaster & N.R. Kleinfeld, *New Orleans is Inundated as Two Levees Fail; Much of Gulf Coast is Crippled; Toll Rises*, N.Y. TIMES, August 31, 2005, at A1:6

5. Salzman, *supra* note 1, at 96.

analysis.

The broader problem is that it may be no more possible to distinguish between water laws based on different types of human uses than it is to distinguish between water, based on whether it is located underground or on the surface, or whether it is contained in an interstate water body, navigable stream, nonnavigable tributary, natural or man-made conveyance, or wetland. Just as the natural flow between these various physical expressions of a common resource elides separate management schemes, so too does the natural flow between possible human uses of water elide separate analytical focus.

An effective system of laws cannot ignore the physical hydrologic interconnections between water in the natural environment, regardless of its surface or subsurface manifestation, or its physical state, whether liquid, solid, or gas. Natural resource laws that ignore those physical realities are unlikely to achieve their purposes. Wetlands, providing the border between land and water, are one obvious example, rife with the ambiguity present within nature itself.<sup>6</sup> A wetland may look to the nonexpert to be no more than land, but its development may have serious adverse consequences for downstream interests, economic and environmental, that are dependent on the wetland's maintenance.

It is no easier to think about how best to manage water by purporting to draw sharp lines between different kinds of uses. Not only does a focus on drinking water potentially obscure consideration of closely related uses serving the same basic human biological needs, but it risks losing sight of other, important uses of water that cannot be so easily severed from the analysis. Water naturally flows within the hydrologic cycle between different kinds of uses just as it flows between different kinds of water bodies. Accordingly, the various laws relating to the allocation of those waters are almost always simultaneously addressing more than one use and not just those related to the act of drinking.

## II. DIRT (AND MUD)

I have always been fascinated by dirt. Perhaps it is because I was born and raised in Central Illinois. Those of us from that part of the nation cannot boast of beautiful mountains, sweeping vistas, or glorious water bodies, the very texture and color of which seemingly shift with the sky above. (Our only noteworthy "water" in my hometown when I was a child was known as the "Boneyard," a creek that ran through the town that

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6. Cf. *United States v. Riverside Bayview Homes, Inc.*, 474 U.S. 121, 132 (1985) ("[T]he transition from water to solid ground is not necessarily or even typically an abrupt one. Rather, between open waters and dry land may lie shallows, marshes, mudflats, swamps, bogs—in short, a huge array of areas that are not wholly aquatic but nevertheless fall far short of being dry land. Where on this continuum to find the limit of 'waters' is far from obvious.").

functioned as an open sewer for unregulated discharges). But what we have is great dirt. Our vista is absolutely flat, but that is only because the glaciers deposited some of the best dirt in the world all around us: a nutrient rich chernozem.

In reading Professor Salzman's article on thirst and drinking water, I was reminded once again of how dirt is invariably overlooked. Water's beauty and much of its fundamental importance lies in the simplicity and relative purity of its chemical structure—just two hydrogen atoms and a single oxygen atom—capable in solid form of producing magnificent crystals. Dirt, by contrast, is a mess of complexity and seeming impurities. Indeed, likely in all times and cultures, one of water's many beneficial uses has literally been to wash away dirt's impurities. Whether referred to as "dirt" or "soil," both terms plainly have strong negative connotations in everyday language. To be "dirty" or "soiled" is not a good thing.

Yet the role that soil plays in the earth's ecosystem and the maintenance of life is absolutely essential. Seemingly static to most people, those expert in soil science appreciate that our soils are an exceedingly dynamic ecological system existing over both time and space. Soil provides a "zone of interaction at the elusive boundary of the biosphere and the geosphere" that supports life, both plant and animal, in a multitude of essential ways.<sup>7</sup> Soil provides the physical locus for necessary interactions of the carbon, nitrogen, sulfur, and oxygen cycles. It regulates, including through respiration, the chemical composition of the atmosphere and hydrosphere. And soil serves as an essential repository for the accumulation of organic matter. Within soil, nature recovers and recycles the energy and the valuable minerals contained within dead plants and animals.<sup>8</sup>

Professor Salzman demonstrates how the nation's history is revealed in laws relating to drinking water. The same is at least as true for soil and equally rich. For instance, some have argued that the events leading to the Civil War arose out of a major disagreement between the North and the South over soil.<sup>9</sup> During the mid-1800s, Northerners sharply criticized Southerners for their agricultural practices, including slavery, in part because of their adverse impact on longer-term soil productivity. There was even a "Free Soil" national political party, whose platform was "free soil, free speech, free labour, and free men." By 1952, the Free Soil Party

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7. Boris G. Rozanov et al., *Soils, in THE EARTH AS TRANSFORMED BY HUMAN ACTION: GLOBAL AND REGIONAL CHANGES IN THE BIOSPHERE OVER THE PAST 300 YEARS* 203 (B.L. Turner ed., 1990).

8. This discussion is borrowed from RICHARD J. LAZARUS, *THE MAKING OF ENVIRONMENTAL LAW* 7 (2004). See Comment, Peter M. Lacy, *Our Sedimentation Boxes Runneth Over: Public Lands Soil Law as the Missing Link in Holistic Natural Resource Protection*, 31 ENV'T L. 433, 439, 442 (2001).

9. Sarah T. Phillips, *Antebellum Agricultural Reform, Republican Ideology, and Sectional Tension*, 74 AGRICULTURAL HISTORY 799, 813-14 (2000).

had twelve members in Congress.<sup>10</sup> It was only after Southern States seceded from the Union that Congress in 1862 was finally able to muster the votes necessary to create the U.S. Department of Agriculture<sup>11</sup> and pass the Morrill Act (which provided public land to states for use as an endowment for agricultural and mechanical colleges and universities)<sup>12</sup> in the absence of Southern opposition.<sup>13</sup>

These days, it is the mixture of soil and water, and the mud that results, wherein one finds some of our greatest contemporary natural resource controversies. Environmentalists see wetlands as presenting a fragile ecosystem of exceptional importance precisely because they serve as nature's border between land and water. For those observers, within wetlands literally lie the ingredients and location for life's creation and sustenance, as well as natural protection from water's destructive potential whether by sheer volumetric force or the introduction of harmful chemical constituents from the outside. Others are more likely to see mere mud. But mud also possesses tremendous economic potential because, if drained of its water, it can be converted into property that is especially valuable for commercial development because of its physical proximity to water: residential properties close enough for their residents to enjoy the water's aesthetic beauty, manufacturing facilities whose owners plan to use water as an ingredient in production, powerplants that can use water's cooling ability, or a city hoping to create a major port for the transportation of goods. The resulting clash of environmental and economic perspectives has fueled decades of regulatory takings challenges in the Supreme Court<sup>14</sup> and is now prompting claims that federal efforts to regulate wetlands use exceeds Congress's authority under the Commerce Clause.<sup>15</sup>

The problem with dirt and soil is one, of course, familiar to natural resources law scholars, practitioners and policymakers. Dirt lacks water's

10. ERIC FONER, *FREE SOIL, FREE LABOR, FREE MEN: THE IDEOLOGY OF THE REPUBLICAN PARTY BEFORE THE CIVIL WAR* (1970). Southerners responded angrily to efforts by Northerners to import their agricultural technology to the South, and literally repelled some from the North who sought to establish farms in the South. As described by one passionate defender of Southern agriculture at the time: "God forbid that we should deem the accumulation of wealth—even if from its most beneficial and best possible source, the fertilization and culture of the soil—as compensation for the loss or deterioration of the mentality and moral qualities of southern men, and more especially of southern women! . . ." Edmund Ruffin, *Address to the Virginia State Agricultural Society on the Effects of Domestic Slavery on the Manners, Habits, and Welfare of the Agricultural Population of the Southern States* (Dec. 16, 1852), reproduced in 13 *SOUTHERN PLANTER* (1853), quoted in WILLIAM M. MATHEW, *EDMUND RUFFIN AND THE CRISIS OF SLAVERY IN THE OLD SOUTH: THE FAILURE OF AGRICULTURAL REFORM* 60 (1988).

11. Act of May 15, 1862, ch. 72, 12 Stat. 387.

12. Act of July 2, 1862, ch. 130, 12 Stat. 503.

13. Phillips, *supra* note 9, at 819-22.

14. See, e.g., *Palazzolo v. Rhode Island*, 533 U.S. 606 (2001).

15. U.S. Const., art. I, cl. 3; see, e.g., *Carabell v. U.S. Army Corps of Eng'rs*, 391 F.3d 704 (6th Cir.), cert. granted, 126 S. Ct. 415 (2005) (No. 04-1384, 2005 Term); *United States v. Rapanos*, 376 F.3d 629 (6th Cir. 2004), cert. granted, 126 S. Ct. 414 (2005) (No. 04-1034, 2005 Term).

charisma. Borrowing from Carol Rose's labels in describing principles of property law, water is the "crystal," while dirt is, well, essentially just "mud."<sup>16</sup> Attention and resources routinely are disproportionately allocated to the crystals, the so-called charismatic resources. Mud is, by contrast, seemingly doomed for underappreciation at best and hostility at worst. In the context of endangered species, biologists have long complained that only the charismatic mega-fauna endangered species receive any meaningful attention.<sup>17</sup> But the problem is persistent throughout natural resources law. The "ordinary" or even the unattractive resources may play at least as important a role in the ecosystem, and sometimes a greater one than those deemed charismatic, but neither the public nor the legal system pays much attention to them.<sup>18</sup>

Professor Rose recently described it as the challenge of explaining to people the beauty of mudworms found in saltwater marshes.<sup>19</sup> Few legal academics do that very well: provide readers with a sense of the wonder of the natural environment in all of its glorious complexity. But there is one person who does it beautifully. With passion. With erudition. And, always, with that terrific, puckish sense of humor, using a turn of phrase that all of the rest of us stupidly think you are not allowed to use in legal scholarship.

I leave you with one recent example, but there are many. Here is what Carol Rose wrote in a chapter of a recently published book that I edited, to which she contributed a chapter on the Supreme Court's decision in *Lucas v. South Carolina Coastal Council*.<sup>20</sup> When I first read her contribution, this was the part that made me stop and smile. And the wonderful thing about reading her words, is that you always hear her voice within them:

Drama comes easily in the places where large bodies of water meet the land. Waves billow and crash against rocky shores, or they lap sonorously against long sweeps of sands. Sunsets and sunrises redden distant horizons as sailors take warning or delight. Birds swoop or stalk in search of unwary fish. Weirdly shaped plants extend grasping roots into the deep, swampy muds of coastal wetlands, reeking of

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16. Carol Rose, *Crystals and Mud in Property Law*, 40 STAN. L. REV. 577 (1988).

17. See, e.g., Russell L. Barsh, *Food Security, Food Hegemony, and Charismatic Animals*, in TOWARD A SUSTAINABLE WHALING REGIME 147, 154-55 (Robert L. Friedheim ed., 2001); Douglas O. Linder, "Are All Species Created Equal?" and *Other Questions Shaping Wildlife Law*, 12 HARV. ENVTL. L. REV. 157, 174-75 (1988); Shannon Petersen, *Comment, Congress and Charismatic Megafauna: A Legislative History of the Endangered Species Act*, 29 ENVTL. L. 463, 469 (1999).

18. See Holly Doremus, *Biodiversity and the Challenge of Saving the Ordinary*, 38 IDAHO L. REV. 325 (2002); S. J. McNaughton, *Ecosystems and Conservation in the Twenty-First Century*, in CONSERVATION FOR THE TWENTY-FIRST CENTURY 115 (David Western & Mary C. Pearl eds., 1989) ("Conservation policy is generally blind to the two classes of organisms most important to human welfare: plants and microbes ... [which] are the crucial, indispensable components of every ecosystem. ...").

19. Carol Rose, *Environmental Law Grows Up (More or Less), and What Science Can Do to Help*, 9 LEWIS & CLARK L. REV. 273, 293 (2005).

20. *Lucas v. S.C. Coastal Council*, 505 U.S. 1003 (1992).



decay while teeming with life.<sup>21</sup>

Doesn't sound a lot like Arizona, which Professor Rose has decided to make her next stomping grounds. But no doubt we will soon be reading equally glorious descriptions of Arizona's endangered Southwestern Willow Flycatcher, Razorback Sucker, and Arizona Hedgehog Cactus. Or perhaps even its dirt and mud. I look forward to it.

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21. Carol M. Rose, *The Story of Lucas: Environmental Land Use Regulation Between Developers and the Deep Blue Sea*, in ENVIRONMENTAL LAW STORIES, 237, 241 (Richard J. Lazarus & Oliver A. Houck eds., 2005).